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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/608,249	06/25/2003	Dale Buermann	DBM-101/US	8548

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EXAMINER	
DUPUIS, DEREK L	
ART UNIT	**PAPER NUMBER**
2883	

DATE MAILED: 12/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/608,249	BUERMANN, DALE	
	Examiner	Art Unit	
	Derek L Dupuis	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 December 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *06 December 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Drawings

1. The drawings were received on 12/6/2004. These drawings are accepted by the examiner.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claims 1, 2, 6-8, 10-17, 19, 20, 22, 23, 25, 26, 28-34, and 38 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Black (US 5,479,543)*** and in further view of ***Fuse et al (US 5,889,626)***.

4. With regard to claims 1 and 25, Black teaches a light guiding apparatus, specifically an optical fiber terminator, (see figure 1A of Black) with an input interface (36) for admitting a light beam (38) from an optical fiber (20) and with an output face for out-coupling the light (see column 2, lines 26-31 of Black). The terminal body (34) as taught by Black can be assumed to be of a uniform index because the terminal body is molded from the same piece of material. Black does not teach a concave reflective surface in the body that is opposite the input interface wherein the surface receives a light beam and reflects the light beam along a near-normal surface. Black also does not teach a convex toroidal reflective surface that receives the reflected light beam from the concave reflective surface and that reflects the light beam in an off-normal direction. Fuse teaches a laser focusing device (see figure 1 of Fuse) with the configuration of a

concave reflective surface (1) and a convex reflective surface (2) (see column 3, lines 41-43 of Fuse). The concave reflective surface (1) receives a light beam (L_A) from the input interface (4) of the device. The light beam (L_A) is reflected in a near-normal direction. The convex reflective surface (2) can be a toroidal reflective surface (see column 2, line 62 through column 3, line 5 of Fuse) and it receives the reflected light beam (L_A) from the concave reflective surface (1). The convex toroidal reflective surface (2) reflects the light beam (L_A) in an off-normal direction towards the output interface (5). It would have been obvious to one of ordinary skill in the art at the time of invention to use the configuration of a concave reflective surface and a convex toroidal reflective surface as taught by Fuse with the optical fiber terminator of Black for the purpose of minimizing wave front aberration and to reduce the focusing spot diameter resulting in a more precise focusing ability (see column 3, lines 37-54 of Fuse).

5. With regard to claims 2 and 26, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Fuse teaches that the azimuth angle between the near-normal direction and the off-normal direction is an acute angle as shown in figure 1 of Fuse. An acute angle, by definition, is less than 90 degress.

6. With regard to claims 6 and 28, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Black teaches that the input interface is a surface face (36) while Fuse teaches in figure 1 that the input interface (4) is located adjacent the convex toroidal reflective surface (2).

7. With regard to claims 7 and 29, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1

and 25. Fuse also teaches that the concave reflective surface is a concave toroidal reflective surface (see column 2, line 62 through column 3, line 5 of Fuse).

8. With regard to claim 8, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 7. Fuse teaches that the concave and convex toroidal reflective surfaces can be adjusted to cancel optical path differences and to minimize wavefront aberration of the beam (see claim 1 of Fuse).

9. With regard to claim 10, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 8. Fuse teaches that the convex and concave toroidal reflective surfaces are dimensioned to focus the light beam (see figure 1 of Fuse).

10. With regard to claims 11 and 30, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Black also teaches that the terminal body is made of a molding material (see column 3, lines 48-56 of Black). It would have been obvious to one of ordinary skill in the art for the terminal body to have the same coefficient of thermal expansion because the entire terminal body is made of the same material, which will have the same chemical properties and composition.

11. With regard to claim 12, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claims 11. Black teaches that the molding material could be plastic (see column 3, lines 48-56 of Black). It is well known to those of ordinary skill in the art that many types of plastics are organic polymers such as polyurethane.

12. With regard to claim 13, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claims 11. Black teaches that the molding material could be glass (see column 3, lines 48-56 of Black).

13. With regard to claims 14 and 31, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Black teaches that the concave and convex reflective surfaces are coated with a reflective material (see column 2, lines 31-36 of Black). For purposes of this rejection, it will be assumed that the limitation "the surface" in line 4 of claims 14 and 31 as discussed above in the 35 U.S.C. 112 2nd paragraph rejection means any surface of the body including the concave and convex reflective surfaces.

14. With regard to claim 15, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 14. Black teaches the use of an optical detector (see reference numbers 38',46, and 48 of figure 3) for monitoring the frequency of the light beam and to monitor "other parameters" (see column 5, lines 23-28 of Black) which could include intensity.

15. With regard to claim 16, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 15. Black teaches in figure 3 that the optical detector is placed at the concave surface of the body.

16. With regard to claims 17 and 32, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Black also teaches that there is a light conditioning element, specifically a grating, on a surface of the body for conditioning the light beam (see column 7, lines 45-58 of Black).

17. With regard to claim 19, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 17. Black teaches the use of a light conditioning element, specifically a grating, in column 7, lines 45-48 of Black.

18. With regard to claims 20 and 33, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Black also teaches that there is a light conditioning element, specifically a grating, on a surface of the body for conditioning the light beam (see column 7, lines 45-58 of Black).

19. With regard to claim 22, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 20. Black teaches the use of a light conditioning element, specifically a grating, in column 7, lines 45-48 of Black.

20. With regard to claims 23 and 34, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Black teaches a "planar input face" (column 4, lines 1-3 of Black) for in-coupling a light beam.

21. With regard to claim 38, Black teaches the method for guiding a light beam through use of an optical fiber terminator (see figure 1A of Black) with an input interface (36) for admitting a light beam (38) from an optical fiber (20) and an output face for out-coupling the light (see column 2, lines 26-31 of Black). The terminal body (34) as taught by Black can be assumed to be of a uniform index because the terminal body is molded from the same piece of material. Black does not teach a concave reflective surface in the body that is opposite the input interface wherein the surface receives a light beam and reflects the light beam along a near-normal surface. Black also does not teach a convex toroidal reflective surface that receives the reflected light beam from the concave reflective surface and that reflects the light beam in an off-normal direction. Fuse teaches a method for focusing a beam through use of a laser focusing device (see figure 1 of Fuse) with the configuration of a concave reflective surface (1) and a convex

reflective surface (2) (see column 3, lines 41-43 of Fuse). The concave reflective surface (1) receives a light beam (L_A) from the input interface (4) of the device. The light beam (L_A) is reflected in a near-normal direction. The convex reflective surface (2) can be a toroidal reflective surface (see column 2, line 62 through column 3, line 5 of Fuse) and it receives the reflected light beam (L_A) from the concave reflective surface (1). The convex toroidal reflective surface (2) reflects the light beam (L_A) in an off-normal direction towards the output interface (5). It would have been obvious to one of ordinary skill in the art at the time of invention to use the configuration of a concave reflective surface and a convex toroidal reflective surface as taught by Fuse with the optical fiber terminator of Black for the purpose of of minimizing wave front aberration and to reduce the focusing spot diameter resulting in a more precise focusing ability (see column 3, lines 37-54 of Fuse).

22. Claims 3, 4, 5, 27, and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Black (US 5,479,543)*** in view of ***Fuse et al. (US 5,889,626)*** as applied to claims 1 and 25 above, and further in view of ***Kuffer (US 3,961,179)***.

23. With regard to claims 3 and 27, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Neither Black nor Fuse teach teaches the use of folding mirrors to direct or guide a light beam. Kuffer teaches an optical system that uses "a beam director means" (see column 2, lines 4-15 of Kuffer) which is the equivalent of the folding mirror disclosed by the applicant in the specification and drawings. It would have been obvious to one of ordinary skill in the art at the time of invention to use the folding mirror of Kuffer in the optical fiber terminator taught by Black in view of Fuse for the purpose of "beam placement" (see column 2, lines 1-15 of Kuffer).

24. With regard to claims 4 and 5, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claim 3. Kuffer teaches the use of folding mirrors as also discussed above in reference to claim 3. Black teaches the use of a light-conditioning element, specifically a reflective coating, on the light guiding tip (see column 4, lines 13-22 of Black). Black does not teach that the reflective coating could be used the folding mirrors, as taught by Kuffer. It would have been obvious to one of ordinary skill in the art to use the reflective coating taught by Black on the folding mirrors taught by Kuffer in the optical fiber terminator taught by Black in view of Fuse, for the purpose of utilizing the folding mirrors to "reflect a wide range of light wavelengths" (see column 4, lines 16-20 of Black).

25. With regard to claim 37, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claim 25. Neither Black nor Fuse teach that the apparatus could be used in a telescopy system. Kuffer teaches a telescopy system with a primary concave reflective surface that could be toroidal and with a secondary convex reflective surface that could be toroidal (see column 2, line 40 through column 3, line 5 of Kuffer). The telescopy system as taught by Kuffer uses a servo motor to control the direction of optical elements (see column 3, lines 6-16 of Kuffer). It would have been obvious to one of ordinary skill in the art at the time of invention to use the telescopy system of Kuffer with the light guiding apparatus taught by Black in further view of Fuse for the purpose of "eliminating the need for moving optical elements" and therefore resulting in a system that is "simple in construction" and is "inexpensive" (see column 2, lines 4-21 of Black).

26. Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Black (US 5,479,543)*** in view of ***Fuse et al. (US 5,889,626)*** as applied to claim 8 above, and further in view of ***Werkheiser et al. (US 6,625,376)***.

27. With regard to claim 9, Black in further view of Fuse teaches an optical fiber terminator as discussed above in reference to claim 8. Neither Black nor Fuse teach that the convex and concave toroidal reflective surfaces are dimensioned to collimate the light beam. Werkheiser teaches an optical fiber cable terminator with a system of reflectors set to collimate a light beam (see the abstract of Werkheiser). It would have been obvious to one of ordinary skill in the art at the time of invention to use the optical fiber terminator as taught by Black in view of Fuse to collimate the light beam as taught by Werkheiser for the purpose of creating an optical system that is "relatively less expensive than prior beam-expanding termini" (see column 9, lines 41-67 of Werkheiser).

28. Claims 18 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Black (US 5,479,543)*** in view of ***Fuse et al. (US 5,889,626)*** as applied to claims 17 and 20 above, and further in view of ***Kapany et al. (US 4,993,796)***.

29. With regard to claims 18 and 21, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 17 and 20. Black teaches the use of a light conditioning element, specifically a coating, on the light guiding tip. Neither Black nor Fuse teach that the coating is either a wavelength filtering coating, an anti-reflective coating, or a polarization-altering coating. Kapany teaches a fiber optic communication module containing a surface with a "a multilayer dielectric coating that reflects most of the light incident on it from within a transparent body, but that transmits a small

fraction" of the light (see column 6, lines 9-20 of Kapany). This is an example of an anti-reflective coating because some of the light is being transmitted instead of being reflective. It would have been obvious to one of reasonable skill in the art to use the anti-reflective coating on a surface as taught by Kapany on the surface of an optical fiber terminator as taught by Black in further view of Fuse for the purpose of "selectively transmitting and reflecting optical signals" from a source (see column 4, lines 43-66 of Kapany).

30. Claims 24 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over ***Black (US 5,479,543)*** in view of ***Fuse et al. (US 5,889,626)*** as applied to claims 1 and 25 above, and further in view of ***Keith (US 4,986,762)***.

31. With regard to claims 24 and 35, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claims 1 and 25. Neither Black nor Fuse teach that the optical fiber terminator could be used in a monolithic fiber array. Keith teaches that a monolithic fiber array made up of several optical fiber terminators (see figures 1 and 2 of Keith). It would have been obvious to one of ordinary skill in the art at the time of invention to use the optical fiber terminator taught by Black in view of Fuse in the monolithic fiber terminator array of Keith for the purpose of providing an array of terminators wherein the terminators "are in a side-by-side relationship to fit in a compact panel ... in such a manner as to afford ready access to the individual connectors for attachment" of optical fibers or other lines.

32. Claim 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over ***Black (US 5,479,543)*** in view of ***Fuse et al. (US 5,889,626)*** as applied to claim 25 above, and further in view of ***Medved et al. (US 6,366,723)***.

33. With regard to claim 36, Black in further view of Fuse teaches a light guiding apparatus, specifically an optical fiber terminator, as discussed above in reference to claim 25. Neither Black nor Fuse teach that the optical fiber terminator could be used in a free-space communication system. Medved teaches a free-space communication system that used with a waveguide that is "terminated by an FC/APC" at the waveguide/air interface (see abstract of Medved). It would be obvious to one of reasonable skill in the art at the time of invention to use the optical fiber terminator taught by Black in further view of Fuse in the free-space communication system taught by Medved for the purpose of terminating an optical waveguide and for guiding the light from the waveguide of an optical communication system in a manner that "eliminates the need for moving optical elements, [and that] ensures quick, easy, and precise beam alignment" (see column 2, lines 1-8 of Black).

Response to Arguments

34. Applicant's arguments filed 12/6/2004 have been fully considered but they are not persuasive. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Fuse provides the motivation of minimizing wave front aberration and to reduce the focusing spot diameter resulting in a more precise focusing ability (see column 3, lines 37-54 of Fuse).

35. While Fuse does not claim the use of a convex and a concave mirror, Fuse teaches in column 3, lines 37-54 that this combination exists and in addition teaches that there are benefits that would motivate one of ordinary skill in the art to use the configuration of a concave reflective surface and a convex toroidal reflective surface as taught by Fuse with the optical fiber terminator of Black.

Conclusion

36. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Derek L Dupuis whose telephone number is (571) 272-3101. The examiner can normally be reached on Monday - Friday 8:30am-4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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